

Remarks

As set forth in the Office Action at pages 2 and 3, the Examiner has issued a restriction finding that the present application has two classes of inventions, Class I including claims 1-21, and Class II including claims 22-29. Applicant hereby confirms the election of claims 22-29 made provisionally with traverse in a telephone conference on February 26, 2004, and Applicant hereby withdraws from consideration claims 1-21 without prejudice to renew.

As set forth in the Office Action, claims 22, 23 and 25-27 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Meyer et al., U.S. Patent No. 5,118,434. Claims 22, 23 and 25-27 also stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Maes et al., U.S. Patent No. 5,366,651. Claims 22-29 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Hansen, U.S. Patent No. 4,728,452.

Claim 22 has been amended to recite that the method of the present invention requires that the alcohol dehydrogenase (ADH) enzyme inhibitor must be added to the fluid containing ethylene glycol to achieve a concentration of ADH enzyme inhibitor of at least 1% by weight of the sum of the weight of the ethylene glycol fraction and the weight of the propylene glycol fraction of the resulting mixture. Support for the amendment to claim 22 may be found at, inter alia, pages 17-22. No new matter has been added.

As recited in claims 22-29 as amended, the present invention is directed to methods of reducing the oral toxicity of fluids containing ethylene glycol by mixing an

ADH enzyme inhibitor with a fluid containing ethylene glycol to reduce the oral toxicity of the fluid. As recited in claims 23 and 24 respectively, in two embodiments of the method, propylene glycol or glycerol are used as the alcohol dehydrogenase enzyme inhibitor. Claims 26-29 recite specific quantities of propylene glycol or glycerol which may be mixed with the ethylene glycol to reduce the oral toxicity of the ethylene glycol containing fluids.

As set forth in the specification at, inter alia, pages 17-21, the inventors discovered that addition of alcohol dehydrogenase (ADH) enzyme inhibitors, such as for example propylene glycol or glycerol, to fluids containing ethylene glycol, such as for example heat transfer fluids used in automobiles, unexpectedly reduced the oral toxicity of the ethylene glycol based fluids below the levels which would have been predicted based on the toxicity of each substance alone.

The Examiner's rejections under 35 U.S.C. § 102(b) and § 103(a) are respectfully traversed for at least the reasons set forth below, as the claims as amended are patentable over the prior art references cited by the Examiner under both 35 U.S.C. § 102(b) and 35 U.S.C. § 103. Maes does not describe, teach or suggest combining ethylene glycol with an ADH enzyme inhibitor, such as for example propylene glycol or glycerol, for any purpose, much less to reduce the oral toxicity of fluids containing ethylene glycol. Meyer and Hansen do not describe, teach or suggest combining a fluid containing ethylene glycol with an ADH enzyme inhibitor in sufficient proportions to reduce the oral toxicity of the fluid containing ethylene glycol. Moreover, none of the references cited by the Examiner describe, or teach or suggest, combining an ethylene glycol based heat transfer fluid with an ADH enzyme inhibitor in any specific proportions, much less the proportions set forth in claims 22-29 as amended.

Meyer, U.S. Patent No. 5,118,434 describes deicing solutions comprising alkylene glycols, water, corrosion inhibitors, and one or more polymeric additives. The composition described by Meyer includes the polymeric additives to prevent precipitation of materials contained in the composition, and precipitation of materials contained in water that may be mixed with the composition.

Meyer is directed to the problem of precipitates formed in deicing solutions. Meyer describes glycol-based deicing fluids which may contain from 50-99 percent alkylene glycols. Meyer lists propylene glycol and ethylene glycol among numerous substance that may be used in the deicing compositions described therein. However, Meyer does not describe, or otherwise teach or suggest, a method to reduce the toxicity of ethylene glycol containing fluids by combining ethylene glycol and an ADH enzyme inhibitor, such as for example propylene glycol or glycerol, in any specific proportions, much less in the proportions specified in the present application in claims 22-29. As demonstrated by the test results set forth in the application at pages 17-21, the toxicity of compositions containing ethylene glycol and propylene glycol, and in particular in the specific proportions set forth in claims 22-29, is unexpectedly reduced to levels that render the compositions safe to use. Where, as here, the Applicant shows that a claimed range achieves unexpected results relative to the prior art, a prima facie case of obviousness is rebutted. In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); MPEP § 2144.05. There is no teaching or suggestion in Meyer to use ethylene glycol and propylene glycol in the proportions specified, and there is no teaching or suggestion of the results unexpectedly achieved by mixing the two in the proportions recited in the amended claims.

Maes et. al., U.S. Patent Number 5,366,651, describes antifreeze concentrates for use in aqueous solutions. Maes is directed to a corrosion inhibitor for use in aqueous solutions, and to antifreeze/coolant compositions containing such a corrosion inhibitor. See Maes at Col. 1, line 8. Maes states that the invention described therein “is directed to a novel corrosion inhibitor composition for use in aqueous systems, an antifreeze/coolant concentrate containing the inhibitor composition and aqueous antifreeze/coolant compositions containing the inhibitor composition.” See Maes at Col. 2, lines 54-58. Thus, Maes is directed primarily toward the corrosion inhibitor used in aqueous antifreeze/coolants. As set forth in the Maes specification and the claims, Maes describes a fluid for use in aqueous solutions comprising “a water soluble liquid alcohol freezing point depressant and a corrosion inhibitor comprising carboxylic acids or their salts and a triazole compound” Maes at Col. 2, lines 62-65 (emphasis added). See also Maes at Col. 9, lines 25-26 (claim 1 directed to a concentrate comprising “a water soluble freezing point depressant”) (emphasis added). Accordingly, Maes describes a composition having a single water soluble liquid freezing point depressant.

Maes does not teach or suggest combining ethylene glycol with an ADH enzyme inhibitor, such as for example propylene glycol or glycerol, for any purpose, much less for the purpose of reducing the oral toxicity of a fluid containing ethylene glycol. The Examiner’s erroneous reading of Maes is based entirely on a single sentence at Col. 3, line 65 to Col. 4, line 8. In this sentence, however, Maes does not suggest combining two or more liquid alcohol freezing point depressants. Rather, Maes is merely listing alcohol freezing point depressants which may be used as the major component in the aqueous antifreeze compositions described in Maes. The sentence cited by the Examiner does not teach or suggest combining ethylene glycol with a second alcohol freezing poin

depressant for any purpose, much less to form a reduced toxicity fluid as described in the present application and recited in claims 22-29. Moreover, Maes does not teach or suggest a method to reduce the toxicity of ethylene glycol containing fluids by adding an ADH enzyme inhibitor, such as for example propylene glycol or glycerol, to form a heat transfer fluid having reduced oral toxicity in the proportions recited in claims 22-29 as amended.

The Examiner's erroneous reading of Maes is a result of reading one sentence in the specification out of context. A rejection under 35 U.S.C § 103 cannot be based on a single sentence taken out of context without considering the remainder of the specification. The Courts have held that "it is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 353 F.2d 238, 147 U.S.P.Q. 391 (CCPA 1965).

In Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987), the Federal Circuit reversed a finding of obviousness based on a hindsight analysis based upon a single sentence in a reference taken out of context. The Court stated that the sentence in the reference had to be read in context. The Court held that it was improper hindsight analysis to take a single line from the reference and view that single line in light of the teaching of the patent at issue to find obviousness. Id. at 448-49.

In the sentence cited by the Examiner at column 3, line 65 through column 4, line 8, Maes provides a listing of water-soluble alcohols that may be used in the invention. Maes refers to "depressants" in the plural only in the context of introducing the listing of substances "which can be employed as major components in the present composition".

Col. 3, line 68 to Col. 4, line 1. Maes does not teach or suggest using combinations or mixtures of more than one alcohol freezing point depressant. For example, in the sentence cited by the Examiner, Maes does not state that combinations or mixtures of the listed substances could be used in the compositions described in the patent.

Moreover, throughout the specification and claims, Maes refers solely to the use of a single water-soluble liquid alcohol freezing point depressant as the major component in the anti-freeze compositions described therein. All of the 16 examples provided by Maes contain only ethylene glycol as the alcohol freezing point depressant. Col. 5, line 3 to Col. 6, line 54. In claim 1, the only independent claim in Maes, the composition is described as containing “a water soluble alcohol freezing point depressant.” (emphasis added). Accordingly, when the specification and the claims are read as a whole, it is plain that Maes teaches only the use of a single alcohol freezing point depressant in the composition described in Maes.

In this case, the Examiner has engaged in precisely the type of improper hindsight analysis rejected by the Court in Bausch & Lomb, Inc. The Examiner has based the rejection under 35 U.S.C. § 103 upon a single sentence from a reference taken out of context, and viewed that line in light of the teaching of the present application regarding the combination of ethylene glycol and a second diol to support a finding of obviousness. When considered as a whole, the Maes reference clearly describes only the use of a single glycol as a major component of the antifreeze formulation described therein.

Moreover, even if Maes suggested the combination of ethylene glycol with propylene glycol or glycerol, which it does not, Maes does not teach or suggest combining the substances in the proportions recited in claims 22-29 as amended. As demonstrated by the test results set forth in the application at pages 17-21, the toxicity of compositions containing ethylene glycol and propylene glycol, and in particular in the

specific proportions set forth in claims 22-29, is unexpectedly reduced to levels that render the compositions safe to use. Where, as here, the Applicant shows that a claimed range achieves unexpected results relative to the prior art, a prima facie case of obviousness is rebutted. In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); MPEP § 2144.05. There is no teaching or suggestion in Maes to use ethylene glycol and propylene glycol in the proportions specified, and there is no teaching or suggestion of the results unexpectedly achieved by mixing the two in the proportions recited in the amended claims.

Hansen, U.S. Patent No. 4,728,452 describes coolant compositions for use in aqueous coolant systems. Col. 1, lines 7-10. The compositions include water soluble corrosion inhibitors to reduce corrosion of metal surfaces in the cooling system using aqueous coolants. Col. 2, lines 24-57. Although Hansen describes the use of alcohol or glycol freezing point depressants in coolant concentrates, Hansen does not teach or suggest combination of any alcohols or glycols to reduce toxicity of the resulting concentrate, much less combination of an ADH enzyme inhibitor such as propylene glycol or glycerol with an ethylene glycol base heat transfer fluid as recited in claims 22-29 as amended. Moreover, Hansen does not describe, teach or suggest combination of an ethylene glycol containing fluid with propylene glycol or glycerol in the proportions set forth in claims 22-29 as amended. As demonstrated by the test results set forth in the application, the toxicity of compositions containing ethylene glycol and propylene glycol, and in particular in the specific proportions set forth in claims 22-29, is unexpectedly reduced to levels that render the compositions safe to use. Where, as here, the Applicant shows that a claimed range achieves unexpected results relative to the prior art, a prima facie case of obviousness is rebutted. In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); MPEP § 2144.05. There is no teaching or suggestion in Meyer to use

ethylene glycol and propylene glycol in the proportions specified, and there is no teaching or suggestion of the results unexpectedly achieved.

None of the cited references anticipate claims 22-29 as amended. To anticipate a claim under 35 U.S.C. § 102(b), each and every element of the claimed invention must be found in a single prior art reference. MPEP § 2131. As set forth in detail above, none of the references cited by the Examiner describe a method for reducing the toxicity of an ethylene glycol based heat transfer fluid by adding an ADH enzyme inhibitor as recited in claims 22-29 as amended. Moreover, none of the references cited by the Examiner describe addition of propylene glycol or glycerol to an ethylene glycol containing fluid in any specific proportions, much less in the proportions set forth in claims 22-29 as amended. Accordingly, for at least these reasons, the references cited by the Examiner do not recite each and every limitation set forth in the claims, and the claims as amended are patentable over the references cited under 35 U.S.C. § 102(b).

The claims as amended are also patentable over the references cited by the Examiner under 35 U.S.C. § 103. None of the references teach or suggest a method to reduce the oral toxicity of an ethylene glycol containing fluids by addition of an ADH enzyme inhibitor. Accordingly, the amended claims are not obvious in view of the references cited by the Examiner for at least this reason.

Moreover, none of the references teach or suggest combining an ethylene glycol based heat transfer fluid with an ADH enzyme inhibitor, such as propylene glycol or glycerol, in the specific proportions set forth in claims 22-29 as amended. As set forth in the specification at, inter alia, pages 17-22, the present inventors discovered that adding an ADH enzyme inhibitor such as propylene glycol or glycerol to an ethylene glycol containing fluid unexpectedly reduced the toxicity of the resulting fluid below the level

that would have been predicted based on the properties of the individual fluids. None of the references cited by the Examiner teaches or suggests combining an ADH enzyme inhibitor with ethylene glycol in any specific proportions, much less in the proportions set forth in claims 22-29. Where, as here, the Applicant shows that a claimed range achieves unexpected results relative to the prior art, a prima facie case of obviousness is rebutted.

In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); MPEP § 2144.05.

Accordingly, claims 22-29 as amended are patentable over the references cited for at least this additional reason.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.


Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A petition for a two month extension of time and associated fee extending the time to respond to Office Action from June 16, 2004 to August 16, 2004 has been filed herewith. No additional fee is believed to be required. However, if an additional fee is required or otherwise necessary to cover any deficiency in fees paid, authorization is

hereby given to charge our Deposit Account No. 50-1402.

Respectfully submitted,

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